

AMENDMENTS TO THE CLAIMS

Claim 1 (cancelled).

Claim 2 (cancelled).

Claim 3 (currently amended) The semiconductor manufacturing apparatus as claimed in claim 2 10, wherein the blades of the arm make the wafers put on the arm according to vacuum absorption.

Claim 4 (currently amended) A semiconductor manufacturing apparatus comprising:
a cassette station in which wafers are loaded;
a stand-by conveying robot for taking the wafers out of the cassette station;
a load lock chamber having a wafer holder in which the wafers taken by the stand-by conveying robot are accommodated;
and a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber;,
a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and
a heater stage for etching the wafers transferred by the rotary robot using a plasma generator,
wherein the wafer holder can be moved upward upwardly and downward downwardly to permit the wafers horizontally transferred by the stand-by conveying robot or shuttle blade to be sequentially loaded into or taken out of the wafer holder, and it can be rotated to axially rotate the wafers loaded or taken toward the reaction chamber or stand-by conveying robot to allow the stand-by conveying robot or shuttle blade to be able to easily draw the wafers therefrom according to horizontal movement.

Claim 5 (cancelled).

Claim 6 (currently amended) A semiconductor manufacturing apparatus comprising:

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station ;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated; and

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber; ;

a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator, wherein a pre-heating part is placed above the shuttle blade, for pre-heating the wafers transferred into the reaction chamber from the load lock chamber before they are moved to the heater stage in order to improve etch rate.

Claims 7 and 8 (cancelled).

Claim 9 (currently amended) ~~The A~~ semiconductor manufacturing apparatus as claimed in claim 1, comprising:

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated;

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber;

a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator, wherein the load lock chamber is placed at each of both sides of the reaction chamber adjacent to the stand-by conveying robot so that the wafers transferred by the stand-by conveying robot can be continuously loaded into or taken out of the load lock chamber even in the process of etching other wafer;

wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 10 (currently amended) ~~The A~~ semiconductor manufacturing apparatus as claimed in claim 2, comprising:

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated;

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber;

a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator;
and

wherein the stand-by conveying robot is placed between the cassette station and the load lock chamber and has a rotatable arm for taking the wafers out of the cassette station and loading them in the load lock chamber, and a plurality of blades, formed at the front end of the arm, for carrying a plurality of wafers; and

wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 11. (cancelled)

Claim 12. (original) The semiconductor manufacturing apparatus as claimed in claim 4, wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 13 (currently amended) ~~The~~ A semiconductor manufacturing apparatus ~~as claimed in claim 5, comprising:~~

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated;

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber;

a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator,

wherein the shuttle blade is operated by an air cylinder to transfer the wafers loaded in the wafer holder of the load lock chamber to the reaction chamber and transfer etched wafers back to the load lock chamber; and

wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 14 (original) The semiconductor manufacturing apparatus as claimed in claim 6, wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 15 (currently amended) ~~The A~~ semiconductor manufacturing apparatus ~~as claimed in claim 7, comprising:~~

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated;

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber, a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator, wherein the plasma generator is set corresponding to each heater stage to allow different gases or the same gas to be introduced into the reaction chamber for plasma process with a controller; and

wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.

Claim 16 (currently amended) ~~The~~ A semiconductor manufacturing apparatus ~~as claimed~~ in claim 8, comprising:

a cassette station in which wafers are loaded;

a stand-by conveying robot for taking the wafers out of the cassette station;

a load lock chamber in which the wafers taken by the stand-by conveying robot are accommodated;

a reaction chamber placed in contact with the load lock chamber, the reaction chamber having a shuttle blade for drawing the wafers accommodated in the load lock chamber out of the load lock chamber in a vacuum state and loading etched wafers in the load lock chamber;

a rotary robot for rotatively transferring the wafers taken out of the load lock chamber to be placed on the shuttle blade; and

a heater stage for etching the wafers transferred by the rotary robot using a plasma generator, wherein the reaction chamber has multiple heater stages, each heater stage being capable of controlling temperature independently; and

wherein an auxiliary plasma generator is set under a predetermined part of the reaction chamber in order to remove remnants attached onto the backside of a wafer before the wafer is placed on the shuttle blade to be transferred.